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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,549	07/10/2003	Zvi Greenfield	E00391.70003 sjh	2807
23628	7590	08/11/2005	EXAMINER	
WOLF GREENFIELD & SACKS, PC FEDERAL RESERVE PLAZA 600 ATLANTIC AVENUE BOSTON, MA 02210-2211			NGUYEN, HIEP T	
			ART UNIT	PAPER NUMBER
			2187	

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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## Office Action Summary

Application No.

10/616,549

Applicant(s)

GREENFIELD ET AL.

Examiner

Hiep T. Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2003.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 1-21, 25-40 and 42-44 is/are allowed.  
6) ☒ Claim(s) 22, 24 and 41 is/are rejected.  
7) ☒ Claim(s) 23 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/10/03.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

1. Claims 1-44 are presented for examination.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

- a. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
3. Claims 22, 24 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tirumala, et al., U.S. Pat. No. 6,523,091 [hereafter, Tirumala] in view of Kershaw, US 2002/0188809.
    - a. As per claim 41:
      - i. Tirumala teaches a way selector system, comprising a way selector for selecting a way for the caching specified data of a primary storage main memory in an N-way set associative memory, wherein an invalid way is selected as the candidate for cache replacement. If there is no invalid way, a cache way is selected based on a state/status of at least one affected resource [see col. 3, lines 9-23 and claim 1].
      - ii. Tirumala, however, does not teach that one of his affected resources is a main memory.
      - iii. Kershaw teaches a similar cache replacement policy, which selects a cache element to be replaced based on the state/status of a main memory [figure 2, page 1, paragraph 0011] for the purpose of achieving higher performance due to the selection of a cache victim that will cause the least delay.
      - iv. One having ordinary skill in the art, who has the two teachings of Tirumala and Kershaw in front of him or her, would lead he or she to further incorporate the teaching of Kershaw into that of Tirumala. This is because the main memory in

Kershaw is also one of the affected resources in the caching operation taught by Tirumala.

- v. Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ logic into the Tirumala way selector for selecting a cache way as the candidate for a cache replacement basing on the status/state of a main memory, as taught by Kershaw. The ability to achieve higher performance provides sufficient suggestion and motivation to one having ordinary skill in the pertinent art to do such further logic employment in the Tirumala way selector.

- b. As per claim 22, the claimed method basically comprises the steps that are carried out by the corresponding elements in system of claim 41. Accordingly, claim 22 is also is rejected for the same reason as set forth for claim 41.
- c. As per claim 24: DRAM has been commonly used in the place of main memories [see also the Kershaw main memories; figure 1].

#### ***Allowable Subject Matter***


4. Claims 1-21 25-40, and 42-44 are allowed over the prior art of record because none of the prior art of record teaches or fairly suggests the operation of selecting a cache way as the candidate for a cache replacement as recited in claim 1, lines 4-18; claim 11, lines 4-12; claim 25, lines 8-15; claim 40, lines 8-13; and claim 42, lines 4-19.
5. Claim 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim 22. The claim would be allowable because none of the prior art of record teaches or fairly suggest the further claimed limitation in claim 23.

#### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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- a. Aglietti et al., US 2001/0014931, teaches a cache management that cause a replacement line to be selected from one of the ways of the cache already allocated to the thread that originates the access request that cause the cache miss.
  - b. Moyer, 6,185,657, teaches a multiple-way cache apparatus that performs a replacement operation using only cache ways that have been selectively enabled during the access operation.
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hiep T. Nguyen whose telephone number is (571) 272-4197. The examiner can normally be reached on Monday-Friday from 9:30 am to 6:00 pm.
8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.
9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Hiep T Nguyen  
Primary Examiner  
Art Unit 2187

HTN